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Conservation  
Systems  
Research

Research  
Project  
Description  
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Contact us:

USDA-ARS-NSDL  
411 S. Donahue Dr.  
Auburn, AL 36832  
334-844-4741

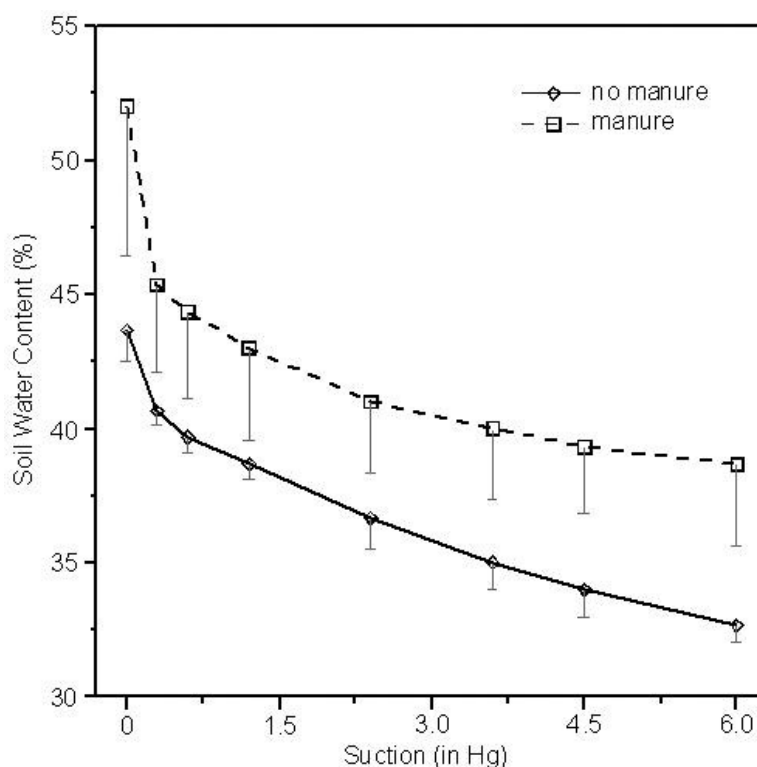
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# Conservation Systems Research

## *Landscape Position, Manure, and Tillage Effects on Soil Physical Properties*

### RESEARCH PROJECT DESCRIPTION NO. 45



Soil organic matter has an important role in soil water retention. Changes in organic matter over a field creates crop yield variability, mainly caused by variations in soil organic matter.

### Researchers

F.J. Arriaga (Soil Scientist), R.L. Raper (Agricultural Engineer)

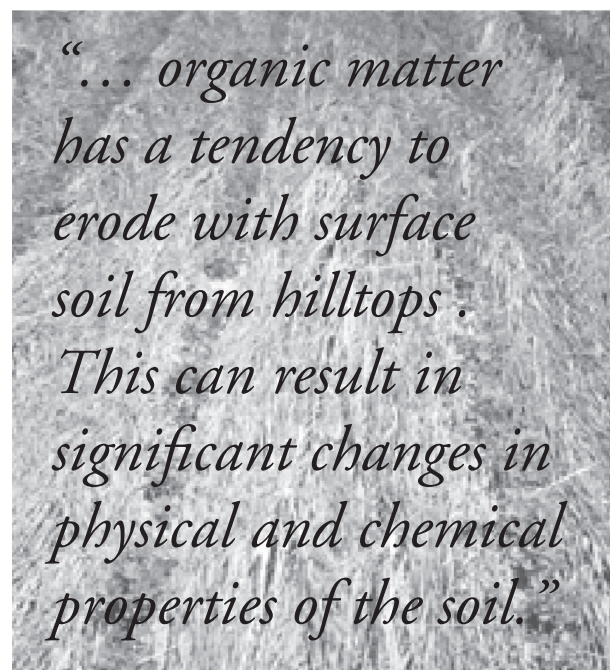
### The Challenge

Soil properties often vary with landscape position. For example, organic matter has a tendency to erode with surface soil from hilltops and elevated areas, accumulating in lower-lying positions. This can result in significant changes in physical and chemical properties of

the soil. Organic matter is a key soil component since it has a crucial role in the formation of soil aggregates, water infiltration, hydraulic conductivity, water retention, and aeration.

Another landscape position effect is depth to restrictive layers. Soils found in the southeast US are usually low in organic matter and, therefore, are more susceptible to the formation of restrictive layers. With erosion and loss of soil organic matter, depth to restrictive layers can vary over a landscape.

Conservation tillage, residue cover, and manure additions can increase soil organic matter content and improve soil physical properties. These can be used to remediate eroded soils and improve productivity.

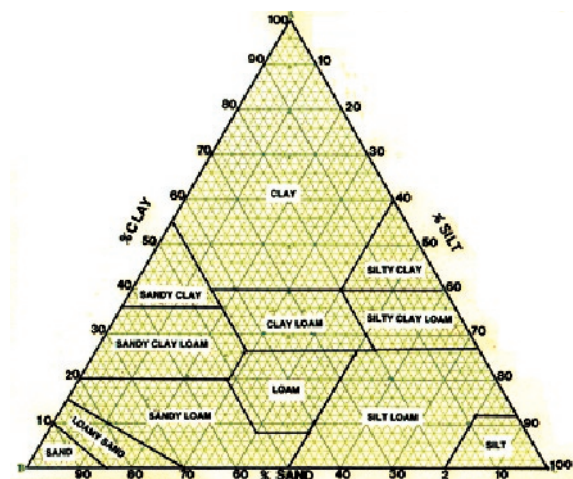


## The Experiment

At the Alabama Agricultural Experiment Station's E.V. Smith Research Center near Milstead, an experiment will determine:

- The relationship between landscape position, soil organic matter content, and depth to restrictive layer.
- The effects of landscape position and tillage operations (conventional and conservation tillage) on water infiltration and retention, hydraulic conductivity, and soil bulk density.

This study will be conducted in plots already established at the Site Specific Experiment Area. Treatments in the Area include conventional and conservation tillage, with and without manure additions. The four tillage/manure treatments are located in various landscape positions. Data to be collected include crop stand counts and yields, soil penetrometer resistance, soil organic matter content, bulk density, water infiltration, and water retention.



Important soil physical properties, such as texture, vary over landscapes and make soil management a challenge.